



CONSIGLIO NAZIONALE DELLE RICERCHE

LABORATORIO PER LA GEOFISICA DELLA LITOSFERA

NASA Space Shuttle
Survey
Ancient Liability
May 9, 1974
20131 MILANO
Posta GEOLAB, Via Mario Bianco, 9
Telefono (02) 2840227 - 2899905

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DOAF 1004567

Title of the investigation: NASA Contract FO 013

E7.4-10789
CR-140142

Principal Investigator : R.Cassinis

Coinvestigators : G.M.Lechi, C.M.Marino,
A.M.Tonelli.

Date : May 8, 1974

NASA Technical Monitor : E. Miller

(E74-10789) SKYLAB MULTISPECTRAL
PHOTOGRAPHY OF ITALIAN VOLCANOLOGY,
GEOLOGY, RICE FIELDS, AND PALEO RIVER
BEDS Progress (Consiglio Nazionale delle
Ricerche, Milan) 3 p HC \$3.25 CSCL 08F

N74-34756

Unclas
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First progress report (up to March 31 st, 1974)

Test site area: Sicily.

Following the experience gathered by the ERTS imageries we are analyzing the photographic material received (SL3 mission) in order to complete and implement our investigation on the Mt. Etna volcanic environment.

A particular attention is given to the vegetation canopy modification and its relationship to the soil type.

The Skylab missions have been carried out shortly before the occurrence of the lateral eruption which started at the end of January '74 in the western slope of the cone. We intend to use the Skylab multispectral data also to discriminate the vegetation type and its seasonal modification around the area where the eruption occurred.

This investigation seems feasible considering the superior geometrical resolution of Skylab imageries comparing with that of ERTS-A. Magmatic gases pressure would have had the strength to enter the flysch layers reaching the surface and the forestry soil and influencing the vegetation life.

The main geologic lineaments have been outlined using ERTS images. Some results have already been presented. ERTS data especially during November 1972 pass emphasized mainly N-S directed lineaments. Unknown lineaments have been discovered in central Sicily. The SL3 photographs don't show generally an agreement with ERTS data mainly because of the different season and sun illumination angle and direction.

On the other hand E-W directed lineaments have been shown, some of them being unknown.

Other areas:

a) rice fields in Northern Italy.

In the frame of the "Agreste" project (European Community preparatory phase of ERTS-B investigation) an inventory has

been made on rice cultivations using false colour Skylab images as well as the multispectral camera photographs of September 3rd.

"False colour ratio" has been applied using this set up:

$\frac{\text{I.R.}}{\text{green}}$	in red colour
$\frac{\text{red}}{\text{orange}}$	in green colour

The main task of this type of enhancement is to extract the vegetation canopy from the back-ground.

Moreover the density slicing technique was employed to discriminate the different type of vegetation.

b) Paleo river beds in Northern Italy.

The multispectral camera photographs have been analyzed to classify the soils surficial structure and for discovering anomalous patterns into the cultivated areas.

By means of a TV analog processor we treated the informations supplied by green and near infrared bands: in particular the slicing of these bands has been performed to distinguish the materials by mapping their spectral behaviour; in fact it is to be expected that the surficial moisture is a major indicator of a paleo river bed.



R. Cassinis, P.I.